

WHAT IS CLAIMED IS:

1 1. An idle speed control system for a vehicle including an
2 internal combustion engine coupled to an automatic
3 transmission which has a torque converter, the idle speed
4 control system comprising:
5 a sensor operative to detect a parameter based on a
6 torque converter speed ratio and generate a signal
7 indicative of the parameter detected; and
8 a controller programmed to:
9 determine basic idle speed; and
10 determine a target idle speed by correcting the basic
11 idle speed based on the signal when the automatic
12 transmission is in a drive range in engine idling condition.

1 2. The idle speed control system as claimed in claim 1,
2 wherein the controller is programmed to determine a
3 correction value so as to increase the target idle speed as
4 the torque converter speed ratio changes from zero toward
5 one.

1 3. The idle speed control system as claimed in claim 1,
2 wherein the parameter is a vehicle speed.

1 4. The idle speed control system as claimed in claim 1,
2 wherein the parameter is the torque converter speed ratio.

1 5. The idle speed control system as claimed in claim 3,
2 wherein the controller is programmed to determine a
3 correction value so as to increase the target idle speed as
4 the vehicle speed increases.

1 6. The idle speed control system as claimed in claim 1,
2 wherein the controller is programmed to determine a

3 plurality of correction values for correcting the basic idle
4 speed which correspond to different values of the basic idle
5 speed.

1 7. The idle speed control system as claimed in claim 6,
2 wherein the controller is programmed to store a plurality of
3 tables corresponding to the different values of the basic
4 idle speed, the tables indicating the correction values,
5 respectively.

1 8. The idle speed control system as claimed in claim 6,
2 wherein the controller is programmed to:
3 store a table corresponding to a reference speed and
4 indicating the correction value;
5 correct the parameter based on the basic idle speed;
6 and
7 retrieve the correction value from the table on the
8 basis of the corrected parameter.

1 9. The idle speed control system as claimed in claim 8,
2 wherein the controller is programmed to correct the
3 parameter by multiplying the parameter by a ratio between
4 the reference speed and the basic idle speed.

1 10. The idle speed control system as claimed in claim 6,
2 wherein the controller is programmed to:
3 store a table corresponding to a reference speed and
4 indicating the correction value;
5 retrieve the correction value from the table; and
6 correct the retrieved correction value based on the
7 basic idle speed.

1 11. The idle speed control system as claimed in claim 10,
2 wherein the controller is programmed to correct the
3 retrieved correction value by multiplying the retrieved
4 correction value by a ratio of a difference between a drive
5 range basic air flow amount at the basic idle speed and a
6 neutral range basic air flow amount at the basic idle speed,
7 to a difference between a drive range basic air flow amount
8 at the reference speed and a neutral range basic air flow
9 amount at the reference speed.

1 12. A method for controlling an engine idle speed in an
2 internal combustion engine of a vehicle, the internal
3 combustion engine being coupled to an automatic transmission
4 having a torque converter, the method comprising:
5 determining basic idle speed when the automatic
6 transmission is in a drive range in engine idling condition;
7 detecting a parameter based on a torque converter speed
8 ratio; and
9 determining a target idle speed by correcting the basic
10 idle speed based on the parameter.

1 13. The method as claimed in claim 12, wherein the
2 correcting operation comprises determining a correction
3 value so as to increase the target idle speed as the torque
4 converter speed ratio changes from zero toward one.

1 14. The method as claimed in claim 12, wherein the
2 parameter is a vehicle speed.

1 15. The method as claimed in claim 12, wherein the
2 parameter is the torque converter speed ratio.

1 16. The method as claimed in claim 14, wherein the
2 correcting operation comprises determining a correction
3 value so as to increase the target idle speed as the vehicle
4 speed increases.

1 17. The method as claimed in claim 12, wherein the
2 correcting operation comprises determining a plurality of
3 correction values for correcting the basic idle speed which
4 correspond to different values of the basic idle speed.

1 18. The method as claimed in claim 17, further comprising
2 providing a plurality of tables which corresponds to the
3 different values of the basic idle speed and indicates the
4 correction values, respectively.

1 19. The method as claimed in claim 17, further comprising
2 providing a table which corresponds to a reference speed and
3 indicates the correction value, correcting the parameter
4 based on the basic idle speed, and retrieving the correction
5 value from the table on the basis of the corrected parameter.

1 20. The method as claimed in claim 19, wherein the
2 correcting operation comprises correcting the parameter by
3 multiplying the parameter by a ratio between the reference
4 speed and the basic idle speed.

1 21. The method as claimed in claim 17, further comprising
2 providing a table which corresponds to a reference speed and
3 indicates the correction value, the controller being
4 programmed to retrieve the correction value from the table
5 and correct the retrieved correction value based on the
6 basic idle speed.

1 22. The method as claimed in claim 21, wherein the
2 correcting operation comprises correcting the retrieved
3 correction value by multiplying the retrieved correction
4 value by a ratio of a difference between a drive range basic
5 air flow amount at the idle speed and a neutral range basic
6 air flow amount at the idle speed, to a difference between a
7 drive range basic air flow amount at the reference speed and
8 a neutral range basic air flow amount at the reference speed.